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A Review on Cryptorchidism-Induced Alopecia in Dogs

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Abstract

A disorder known as cryptorchidism occurs when a single or both testicles are unable to descend into the scrotum from the belly. Alopecia is among the most prevalent dermatological conditions. The literature on alopecia in dogs caused by cryptorchidism is reviewed in this article. It concluded that cryptorchidism in dog's presents with variable anatomical patterns across breeds and contributes to fertility issues and increased neoplastic risks due to altered seminiferous epithelium. Ultrasonography remains the gold standard for diagnosis, while surgical removal of both retained and descended testes is essential. Additionally, cryptorchidism may be associated with dermatological manifestations such as alopecia areata-like disease, with cyclosporine showing partial efficacy. These findings highlight the importance of early diagnosis and comprehensive clinical management of cryptorchid dogs.

Keywords; Cryptorchidism, Alopecia, Dog, Neoplastic risks, Diagnosis, Cryptorchid dogs, etc.

INTRODUCTION

The scrotum contains a pair of male sex glands called testes. The testes have two roles in animals: they are gametogenic (producing male gametes, or spermatozoa), and they are endocrine (producing and secreting male sex hormones, or androgens, into the circulation). Dog testicles, in contrast to those of other animals, don't fall via the inguinal canal" until three to four days after birth, and on day 35 postnatally, they are at their highest point in the scrotum [1]. They remain in their last scrotal location till the animal is six months old. The activity of the gubernaculum mediates the regulation of testicular descent by both androgenic and non-androgenic mechanisms. When the infant is agitated or terrified, the testicles are small, flexible, and can migrate among "the scrotum and the inguinal canal" in neonatal canines [2]. Similar to other animal species, dogs with cryptorchidism have their testes and related anatomical structures within the belly or inguinal canal delayed; that is, they do not descend into the scrotum. Unilateral and bilateral cryptorchidism are classified according to whether one or both testicles are still present, whereas abdominal, inguinal, and subcutaneous cryptorchidism are classified according to the location of the remaining testicle [3]. Bilateral cryptorchids are often infertile and unable to generate viable sperm, although unilateral cryptorchids may. Spermatic cord torsion and testicular neoplasia are more common in dogs with cryptorchids.

The skin is the body's largest organ, comprising 15 to 25% of the animal's total weight and acting as the body's initial line of defence. The scientific community has increasingly been interested in skin. Skin disease is among the most prevalent health problems in dogs. Both the cat and his owner need a pet coat [4]. Having dogs with healthy hair is something that pet owners always want. In small animal medicine, dermatological illnesses are among the most significant, often reported, and challenging issues for veterinarians to address.

In the caseload of tiny animals, skin affections constitute a substantial portion. Animals suffering from dermatological problems are uncomfortable because they scratch and itchy all the time [5]. In small animal medicine, dermatological problems are among the most prevalent and challenging issues that veterinarians deal with. One of the most prevalent dermatological conditions is alopecia. Alopecia is the term for partial or total hair loss in areas where hair was previously present. Hair loss, or alopecia, may be localised or widespread. Every year or twice, a dog sheds its coat; new hair grows in about six weeks to replace the old. Dogs with long hair and thick coats that are kept inside may shed more often [6].

Cryptorchidism in Dogs

Male dogs who have one or both testicles that have not lowered into "the testicular sac (scrotum)" are said to have cryptorchidism. Between six and sixteen weeks of age is when testicles typically descend. In a newborn dog, the testicles are often situated close to the inguinal ring, which is a region around the groin. "The gubernaculum", a structure that links the testicle to the scrotum, serves as a guide. The kidney is close to this structure during development [7].

When the gubernaculum does not grow normally, "the testicle or testicles" do not descend into the scrotum, resulting in cryptorchidism. In most cases, the left testicle descends when only one does, whereas the right testicle does not. The dog is normally infertile if neither testicle descends since sperm production is often inhibited by body warmth [8].

Causes of Cryptorchidism in Dogs

The X chromosome is associated with cryptorchidism, which is a genetic condition. Cryptorchidism is more likely to be present in the progeny if the dog's parents are known to have had it. Breeds that are prone to have the gene for cryptorchidism include:

- “Yorkshire Terriers
- Pomeranians
- French Poodles
- Siberian huskies
- Miniature Schnauzers
- Shetland Sheepdogs
- Chihuahuas
- German Shepherds
- Dachshunds
- Brachycephalic (smoosh-faced) breeds”

Treatment of Cryptorchidism in Dogs

Surgery is the only therapy available for cryptorchidism. To prevent testicular cancer and torsion, which usually affect the undescended testicle, as well as to prevent breeding, the dog should be neutered.

First, "the undescended testicle" must be identified, which can complicate the surgical process. The following procedures can be employed to accomplish this:

- **Palpation:** a process where a certain location is identified by applying pressure points from the fingers. To find out whether the testicle is close to the groin, this might be useful.
- **Ultrasound:** A medical imaging tool that may be used to find a testicle if probing is not an option.
- **Exploratory surgery:** A surgical procedure that involves the opening of the abdominal cavity and the surgeon's examination of the abdomen to identify the retained testicle. As the operation helps to identify the testicle's possible location to save surgical time and problems, this usually happens after palpation and ultrasound.

Anywhere between the kidney and the scrotum might be the location of the undescended testicle or testicles. Finding them might be more challenging since they could be smaller than typical testicles. Other tissues may conceal the testicle or testicles. In order to identify and remove both testicles, dogs with this condition usually need many surgical sites [9].

Alopecia (Hair Loss) in Dogs

When a dog has severe thinning or complete hair loss (baldness), its skin becomes exposed. It differs from the typical seasonal or year-round shedding that dogs go through. The life cycle of a dog's hair follicles includes natural shedding. Alopecia is the result of an irregularity in "the hair follicle" that disrupts the hair's typical life cycle. Puppies of all ages and all dog breeds are affected [10].

Hair loss can be temporal or permanent, and it can be congenital (present at birth) or acquired (occurs after birth in a dog with normal hair). Some puppies may be born with alopecia, while others may have congenital hair loss and develop a normal coat over time [11].

Causes Alopecia

Dr. Klein asserts that alopecia may arise from a variety of causes. Some of the most prevalent causes of hair loss in canines are as follows:

- “Bacterial infection
- Fungal infections, like ringworm

- Allergies with scratching or chewing
- Parasites, like fleas and ticks
- Mange caused by mites
- Genetic susceptibility, such as hairless breeds
- Nutritional causes, like vitamin deficiency
- Endocrine or hormonal disorders, such as Cushing's disease and hypothyroidism
- Chemotherapy to treat cancer
- Hormonal changes
- Pressure sores
- Trauma
- General aging"

These parasites feed on animal blood, like in the case of fleas. Your dog may scratch because of redness, itching, and swelling in the region caused by a flea bite. Furthermore, Dr. Klein notes that dogs might have flea bite dermatitis, an allergic response to flea saliva. If germs get into the wound, the saliva may result in secondary skin infections, persistent scratching, and hair loss and breakage.

Treatment of Hair Loss in Dogs

A veterinarian's accurate diagnosis is essential for the successful treatment of canine hair loss. Even little alopecia patches that are not uncomfortable or itchy may resolve on their own. Alopecia in canines may not be curable and treatment may require a lifetime, contingent upon the underlying cause. In certain instances, it may require a significant amount of time to obtain a precise diagnosis. Your doctor will provide suggestions in the meantime on how to ease your dog's discomfort and lessen symptoms like itching, including:

- "Anti-itch, hydrating, and/or soothing shampoo
- Anti-itch spray"

LITERATURE REVIEW

(Cho et al., 2025) [12] In dogs and cats presenting for elective gonadectomy, the study's goals were to report "the incidence, breed distribution, clinical findings (anatomic location, number of afflicted testicles, and side)", and surgical therapy of cryptorchidism. Different body conformations and breeds are affected by cryptorchidism. In both dogs and cats, cryptorchid testes were more typically found unilaterally on the right side and more often seen in the inguinal region than in the belly. In both dogs and cats, testes in the belly needed an average of more total incisions for surgical care than testes in the inguinal region. Dogs and cats should be assessed for cryptorchidism separately due to variations in anatomy, prevalence, and surgical methods. To effectively remove cryptorchid testes, it may be helpful to locate and identify the retained testicle or testicles in advance.

(Devi et al., 2024) [13] A digital rectal probe showed an enlarged prostate, and the dog was malnourished with bilateral baldness and swollen udder and teats. A provisional diagnosis of bilateral testicular tumour and prostate abscess was made in this instance. Serum biochemistry showed no pathological alterations other than hypoglycemia, with haematology revealing thrombocytopenia and leucocytosis with neutrophilia. Testicular tumour was suggested by the serum hormonal examination, which showed increased oestrogen and decreased testosterone concentrations. The two larger polymorphic retained testicles were removed when a coeliotomy was done. The prostate was exteriorised, 20 millilitres of pus were aspirated, and metronidazole was used to cleanse the area. During the three days after surgery, the animal was given Ringer's lactate (10 ml/kg), "Amoxycillin and Sulbactum (15 mg/kg), pantaprazole (1 mg/kg), metronidazole (15 mg/kg) twice a day", and Tramadol (2 mg/kg). suggested that the owner administer tablets of Finasteride (10 mg) for 30 days and Augmentin (625 mg) for 5 days. The animal recovered without incident. The patient was identified as bilateral seminoma coupled with prostatic abscess based on the testicular histology.

(Hernández-Jardón et al., 2022) [14] The purpose of this research is to characterise the histological development of the testicles in dogs with congenital CO and assess whether the species would be a suitable model for studying this condition in people. The animals' contralateral testis was examined and analysed in relation to the undescended testis in the CO group. Evaluations and descriptions were made of histological development, the existence of cells with gonocyte shape, cell proliferation, testicular lipoperoxidation, and the levels of testosterone, oestradiol, FSH, and LH. The CO animals had changes in their contralateral testes that placed them in between the CO and control testes. Human and canine testicular development is comparable in dogs with CO. According on the study's findings, this animal could provide a good model for researching CO in people.

(SPASOJEVIĆ et al., 2022) [15] The condition known as cryptorchidism is characterised by the testicles and related abdominal or inguinal canal anatomical components being delayed. Although its exact cause is unknown, cryptorchidism in dogs is thought to have a hereditary foundation. Adspection and palpation techniques were used in the first clinical examination of dogs suspected of having

cryptorchidism. Thereafter, an ultrasound examination was used to locate and identify any remaining testicles. Both the biologically descending and residual testicles were surgically removed from every dog. The remaining testicles were removed and subjected to a pathohistological study. The comparison between the surgical and ultrasound identification and localisation of the remaining testicles in this research had a 100% predictive value. One dog had tumorous alterations in the kind of seminoma on one testicle (unilateral inguinal cryptorchidism), according to the pathohistological study findings. The other nine dogs had morphologically altered testicles, and testicular atrophy was the diagnosis.

(Spangenberg, 2021) [16] In dogs, cryptorchidism is an autosomal recessive, heritable condition. Given the likelihood of the problem being passed by offspring, animals with this ailment should not be utilised for breeding due to its expected nature. A relatively higher prevalence of cryptorchidism is observed in pedigree canines and smaller breeds, including "the English Bulldog, Boxer, Chihuahua, Shetland Sheepdog, Siberian Husky, and Yorkshire Terrier", with an incidence rate of 0.8 to 10%. The purpose of this report is to provide a concise summary of the diagnosis, treatment, and origin of canine cryptorchidism.

(Scarampella & Roccabianca, 2018) [17] Humans, rats, dogs, and horses who have alopecia areata (AA)-like illness may have multifocal patchy hair loss. In terms of the disease's immunological processes, histopathology, and clinical presentation, there have been notable parallels between AA cases in humans and nonhuman animals. The majority of canine AA-like lesions are well-defined alopecic patches that typically, but not always, affect the face and head and spread to the legs and ear pinnae. In some instances, the distribution of hair loss may be more widespread. In canine AA-like illness, hair regrowth is often spontaneous, much as in humans, and refractory instances typically respond to therapy with cyclosporines or glucocorticoids. In veterinary medicine, the diagnosis of AA is based on immunohistochemistry, histology, presentation, and regrowth after treatment. In this case study, a dog exhibiting symmetrical hair loss is evaluated dermoscopically for the first time for AA-like illness.

CONCLUSION

This review highlights the multifaceted impact of cryptorchidism in dogs, emphasizing its occurrence across various breeds and body types. A higher prevalence of inguinal and right-sided unilateral cryptorchidism was noted, though other presentations also occurred. Effective surgical management requires individualized planning, aided by precise preoperative localization of retained testes—where ultrasonography serves as the diagnostic gold standard, with sensitivity ranging from 90% to 100%. Surgical removal of both retained and normally descended testicles remains the definitive treatment to prevent infertility and neoplastic transformation. Cryptorchidism-induced alterations in testicular histology mirror those observed in humans, particularly affecting the seminiferous epithelium, thereby compromising fertility and increasing the risk of testicular neoplasia. Additionally, an AA-like alopecia condition was observed in association with cryptorchidism, with clinical and histopathological features resembling autoimmune-mediated hair loss. Though dermoscopic findings were nonspecific, partial clinical improvement was achieved with oral cyclosporine, suggesting an immune-mediated etiology potentially linked to hormonal imbalances caused by cryptorchidism. Overall, this review underscores the importance of early diagnosis, surgical intervention, and monitoring for dermatological signs potentially associated with cryptorchidism in dogs.

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